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U.S. Army Toxic and Hazardous Materials Agency

Enhanced Preliminary Assessment Report:

Milford Army Housing Units Milford, Connecticut

October 1989

prepared for

Commander
U.S. Army Toxic and Hazardous Materials Agency
Aberdeen Proving Ground, Maryland 21010-5401

prepared by

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Argonne National Laboratory has conducted an enhanced preliminary assessment of the Army housing property located in Milford, CT. The objectives of this assessment include identifying and characterizing all environmentally significant operations, identifying areas of environmental contamination that may require immediate remedial actions, identifying other actions which may be necessary to resolve all identified environmental problems, and identifying other environmental concerns that may present impediments to the expeditious sale of this property.

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SUMMARY

The Milford military housing facility located in Milford, Conn., presents no imminent or substantial threat to human health or the environment. There is no evidence to suggest that hazardous or toxic constituents have ever been released from this property. No immediate remedial actions, therefore, are warranted for the site.

Although these housing units were originally developed in conjunction with a Nike missile battery, available documentation and circumstantial evidence indicate that the housing property was wholly independent of the battery's operational activities. No Nike-related wastes were delivered to this property for management or disposal. Furthermore, since this property was independent of the Nike missile operations with respect to all necessary utilities, there is no possibility of migration of Nike-related wastes along buried utility lines. Nevertheless, two potential environmental impacts from this property have been identified which warrant remedial action.

One potential environmental impact involves the above-ground fuel-oil storage tanks. The exteriors of the new above-ground tanks appear not to have an adequate protective coat, and areas of rust were observed on some of them. Also, the effectiveness of the concrete containment box beneath each tank would be compromised if the drainage top on the box were to be left in the open position for an extended period of time.

An additional concern involves the abandoned underground oil-storage tanks. Leaks have been suspected for the underground tanks behind units #10 and 16. Existing property records indicate that the tanks are approximately 30 years old and there is no indication as to whether they were installed with the benefit of cathodic protection or protective coatings. No investigations to confirm the presence of petroleum contamination were ever conducted and these tanks, along with the other underground tanks, were abandoned in place.

The following actions are recommended prior to the release of this property:

- Assure the integrity of the above-ground fuel-storage tanks, treat for rust, and apply a proper protective coat.
- Develop and implement a solution to the possibility of containment-box drainage tops being left in the open position.
- Conduct subsurface soil sampling at the abandoned underground tanks behind units #10 and 16 for petroleum contamination.

These recommendations assume that this property will most likely be used for residential housing.

1 INTRODUCTION

In October 1988, Congress passed the Defense Authorization Amendments and Base Closure and Realignment Act, Public Law 100-526. This legislation provided the framework for making decisions about military base closures and realignments. The overall objective of the legislation is to close and realign bases so as to maximize savings without impairing the Army's overall military mission. In December 1988, the Defense Secretary's ad hoc Commission on Base Realignment and Closure issued its final report nominating candidate installations. The Commission's recommendations, subsequently approved by Congress, affect 111 Army installations, of which 81 are to be closed. Among the affected installations are 53 military housing areas, including the Milford housing area addressed in this preliminary assessment.[1]

Legislative directives require that all base closures and realignments be performed in accordance with applicable provisions of the National Environmental Policy Act (NEPA). As a result, NEPA documentation is being prepared for all properties scheduled to be closed or realigned. The newly formed Base Closure Division of the U.S. Army Toxic and Hazardous Materials Agency is responsible for supervising the preliminary assessment effort for all affected properties. These USATHAMA assessments will subsequently be incorporated into the NEPA documentation being prepared for the properties.

This document is a report of the enhanced preliminary assessment (PA) conducted by Argonne National Laboratory (ANL) at the Army stand-alone housing area in Milford, Conn.

1.1 AUTHORITY FOR THE PA

The USATHAMA has engaged ANL to support the Base Closure Program by assessing the environmental quality of the installations proposed for closure or realignment. Preliminary assessments are being conducted under the authority of the Defense Department's Installation Restoration Program (IRP); the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Public Law 91-510, also known as Superfund; the Superfund Amendments and Reauthorization Act of 1986, Public Law 99-499; and the Defense Authorization Amendments and Base Closure and Realignment Act of 1988, Public Law 100-526.

In conducting preliminary assessments, ANL has followed the methodologies and procedures outlined in Phase I of the IRP. Consequently, this PA addresses all documented or suspected incidents of actual or potential release of hazardous or toxic constituents to the environment.

In addition, this PA is "enhanced" to cover topics not normally addressed in a Phase I preliminary assessment. Specifically, this assessment considers and evaluates the following topical areas and issues:

- Stat with respect to regulatory compliance,
- Asbestos,
- Polychlorinated biphenyls (PCBs),
- Radon hazards (to be assessed and reported on independently),
- Underground storage tanks,
- Current or potential restraints on facility utilization,
- Environmental issues requiring resolution,
- Health-risk perspectives associated with residential land use, and
- Other environmental concerns that might present impediments to the expeditious "excessing," or transfer and/or release, of federally owned property.

1.2 OBJECTIVES

This enhanced PA is based on existing information from Army housing records of initial property acquisition, initial construction, and major renovations and remodeling performed by local contractors or by the Army Corps of Engineers. The PA effort does not include the generation of new data. The objectives of the PA include:

- Identifying and characterizing all environmentally significant operations (ESOs),
- Identifying property areas or ESOs that may require a site investigation,
- Identifying ESOs or areas of environmental contamination that may require immediate remedial action,
- Identifying other actions that may be necessary to address and resolve all identified environmental problems, and
- Identifying other environmental concerns that may present impediments to the expeditious transfer of this property.

1.3 PROCEDURES

The PA began with a review of Army Housing records located at Fort Devens, Mass., the week of May 15-19, 1989. Additional information was obtained on July 17, 1989, from the Family Housing Office located in New Haven, Conn., and from an interview with the Area Facilities Engineer at his office in Windsor Locks, Conn., on July 20, 1989. A site visit was conducted at Milford, Conn., on July 18, 1989, at which time additional information was obtained through personal observations of ANL investigators and discussions with the site's next-to-senior occupant. Photographs were taken of the housing units and surrounding properties as a means of documenting the condition of the housing units and immediate land uses. Site photographs are appended.

All available information was evaluated with respect to actual or potential releases to air, soil, and surface and ground waters.

Access to individual housing units was obtained through the senior occupant at the facility. In addition, ANL investigators revisited the property on September 6, 1989, at which time the interiors of all but two of the units (units #9 and 10, Alpha Street) were inspected.

2 PROPERTY CHARACTERIZATION

2.1 GENERAL PROPERTY INFORMATION

The Milford housing property, 4.0 acres in area, lies in the eastern portion of New Haven County, Conn., and is about 9 miles southwest of New Haven. Figures 1 and 2 show the general location of the facility.

The housing units were developed in 1958,[2] and were recently renovated. No additional major construction has taken place on the property since it was developed. The New York District Army Corps of Engineers is responsible for major renovations or upgrading within the facility. Routine maintenance is conducted by the Area Facility Office in Windsor Locks. Renovations inside and outside of the houses took place in 1988.

2.2 DESCRIPTION OF THE FACILITY

Figure 3 presents the site plan of the housing property.

Housing Units

Each of the 16 houses on the property is a wood-frame, one-story, 3-bedroom, single-family unit. Five of the units have an attached garage.[2] The dimensions of the buildings without an attached garage are 47' 4" x 24' 8" (1,168 square feet); those with a garage are 59' 4" x 24' 8" (1,464 square feet).[2] The houses are built on concrete slabs with no structures underground, and their floors are covered with asbestos tile.[3] The walls are covered inside with sheetrock panels. The outside walls are plywood, covered originally with cedar shakes. The cedar shakes were later covered with vinyl siding. The roofs of the houses are made of asphalt shingles on wood sheathing.

Utilities

The property utilizes city water, and no water wells exist on the property. Other utility connections are the city electric power and telephone lines. According to the Area Facilities Engineer, all water and electrical lines, utility poles, and electrical transformers on the property are owned by the U.S. Government, which is responsible for maintaining them. Therefore, the cost of repairs made to the property's utility distribution systems by public utility personnel is borne by the government. There is no documentation on the possible presence of PCBs in the transformers. However, no evidence of spills or leaks from the transformers was found. Solid wastes are removed from the property by a private contractor.

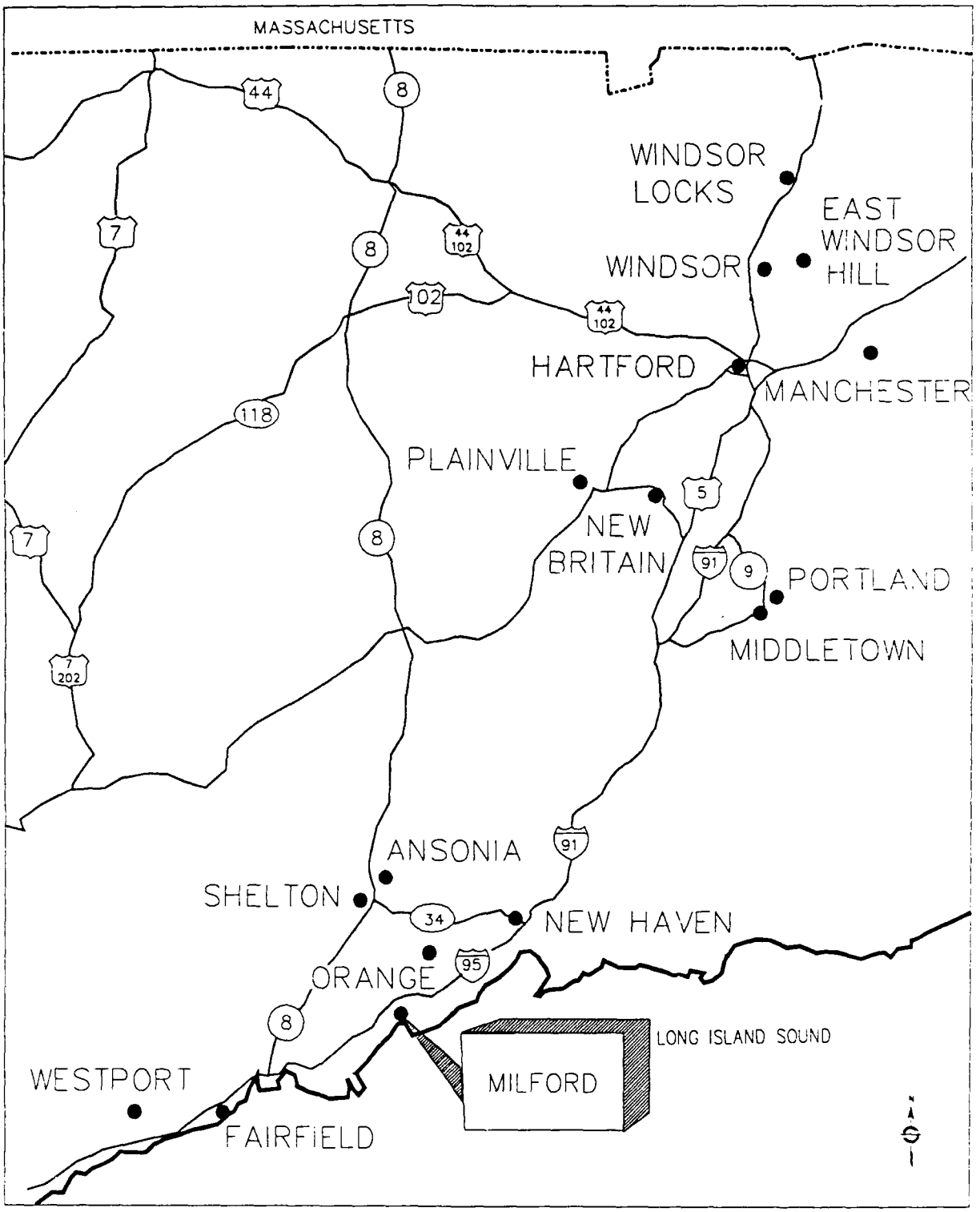

FIGURE 1 Location Map of Connecticut Army Housing Facilities

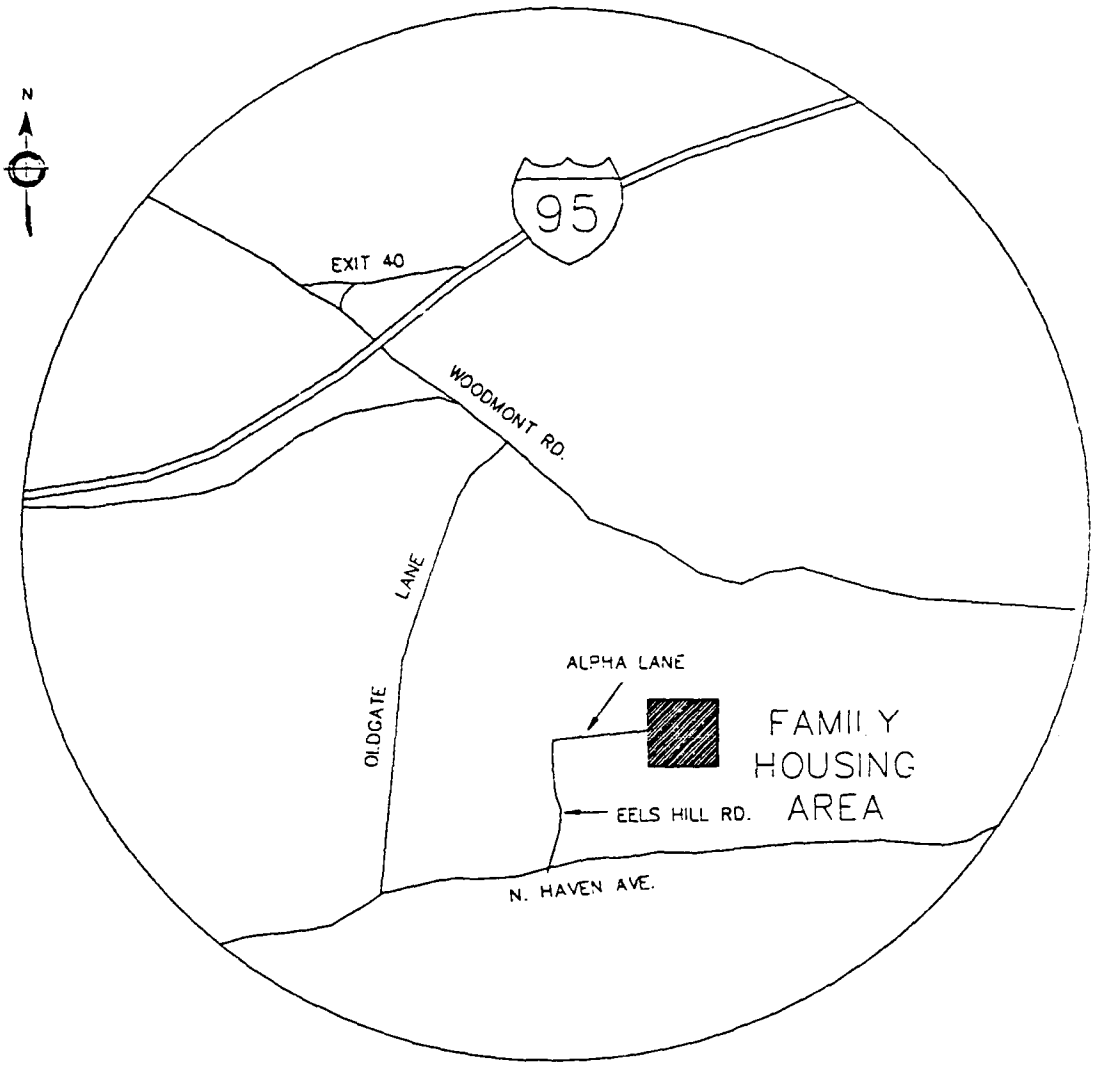

FIGURE 2 Vicinity Map of Milford Army Housing Units

Sewage

Since original construction, the housing has been serviced by the Milford sewer system. The sanitary sewage is currently transported by sewer network connected to each house and through a main line connecting with the main sewer system of the city of Milford. No sewage problems have been reported at the facility.

The development and construction of the family housing area in 1957 resulted in flooding and soil erosion on the property adjacent to the southeast in later years.[4] In November 1974, the Army requested a Real Estate Planning Report from the New York District, Army Corps of Engineers (COE). In 1975, the COE recommended first that a perpetual flowage easement on Connecticut State-owned land be obtained, and second, that a similar easement be obtained on land owned by the Quinnipiac Council Boy Scouts of America, Inc.[5] Modifications were made to route the storm drainage to an old leaching field owned by the Quinnipiac Council 34 of the Boy Scouts of America, Inc.[4]

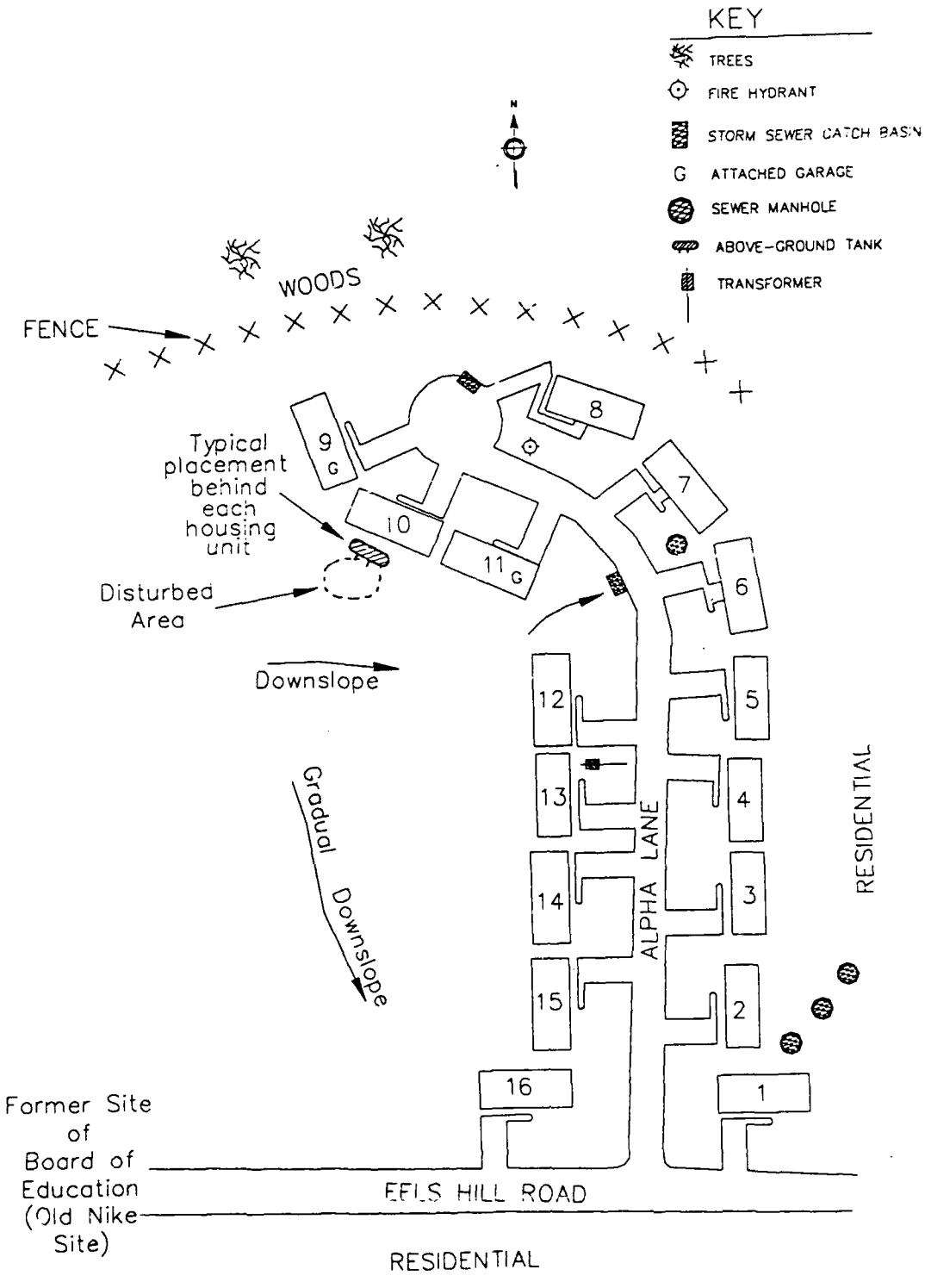

FIGURE 3 Site Plan Map of Milford Army Housing Units

Fuel Storage

The houses are heated by forced hot-air furnaces.[3] Fuel oil was initially stored in 275-gallon underground tanks (installed during original housing construction). All underground tanks were replaced with new above-ground tanks located at the rear of the houses. The old tanks were drained of oil, filled with fine gravel, and left in place. The fill pipes on the old tanks were cut off just below ground level. The fuel-tank replacement was contracted through the New York District Army Corps of Engineers, approximately two years ago. There had been oil leakage problems with some of the old tanks; all were replaced, however. There is no documentation detailing the extent of contamination encountered when the tanks were decommissioned, or describing remedial actions that may have occurred. No analytical results could be located.

Storm Drainage System

Drainage of the property is facilitated by surface runoff and a storm drain running westward.[5] The storm drain is connected to the city system via the storm-drainage pipe located behind the housing facility on the south side. Storm-drain catch basins along Alpha Avenue facilitate the drainage. This property is not located in a floodplain.[2]

Other Permanent Structures or Property Improvements

Since the development of the property, no other permanent structures have been built, nor have there been any property improvements other than the recent renovations to the housing units.

2.3 PROPERTY HISTORY

2.3.1 Nike Defense Program and Typical Battery-Level Practices

Generic information on the national Nike antiaircraft defense program has been compiled in two studies, one commissioned by the Army Corps of Engineers[6] and the other by the U.S. Army Toxic and Hazardous Materials Agency.[7] In both studies, independent contractors relied on information contained in unclassified documents related to the Nike surface-to-air missile program, including engineering drawings and specifications (for the facilities and the missiles themselves), interviews with Army personnel participating in the Nike program, and operations manuals and directives relating to the operations and maintenance of Nike facilities. Taken together, these two reports represent the most complete assemblage of generic information on the Nike missile program from an environmental perspective. Salient points from both reports are condensed below.

At its zenith in the early 1960s, the Nike program included 291 batteries located throughout the continental United States. The program was completely phased out by

1976, with many of the properties sold to private concerns or excessed to state or local governments for nominal fees.

Nike Ajax missiles were first deployed in 1954 at installations throughout the continental United States, replacing, or in some cases augmenting, conventional artillery batteries and providing protection from aerial attack for strategic resources and population centers. Typically, Nike batteries were located in rural areas encircling the protected area. The Ajax was a two-stage missile using a solid-fuel booster rocket and a liquid-fuel sustainer motor to deliver a warhead to airborne targets.

The Ajax missile was gradually replaced by the Nike Hercules missile, introduced in 1958. Like the Ajax, the Hercules was a two-stage missile, but it differed from the Ajax in that its second stage was a solid-fuel rather than liquid-fuel power source and its payload often was a nuclear rather than conventional warhead. Ajax-to-Hercules conversions occurred between 1958 and 1961 and required little change in existing Nike battery facilities. A third-generation missile, the Zeus, was phased out during development and consequently was never deployed.

A typical Nike missile battery consisted of two distinct and separate operating units, the launch operations and the integrated fire control (IFC) operations. The two operating areas were separated by distances of less than two miles, with lines of sight between them for communications purposes. A third separate area was also sometimes part of the battery. This area was typically equidistant from the two battery operating sites and contained housing for married personnel assigned to the battery. Occasionally, these housing areas also contained battalion headquarters, which were responsible for a number of Nike batteries.

Depending on area characteristics and convenience, the housing areas were often reliant on the launch or IFC sites for utilities such as potable water, electrical power, and sewage treatment. In those instances, buried utility lines connected the housing area to one or both of the other battery properties. It is also possible, however, that housing areas were completely independent of the missile launcher and tracking operations. In those instances, the necessary utilities were either maintained on the housing site or purchased from the local community. In many localities, as the character of the land area around the housing units changed from rural to suburban or urban, communities extended utility services to the housing unit locations, in which case conversions from independent systems to community systems were made.

A large variety of wastes was associated with the operation and maintenance of Nike missile batteries. Normally encountered wastes included benzene, carbon tetrachloride, chromium and lead (contained in paints and protective coatings), petroleum hydrocarbons, perchloroethylene, toluene, 1,1,1-trichloroethane, 1,1,2-trichloroethane, and trichloroethylene. Because of the rural locations of these batteries, and also because very few regulatory controls existed at that time, most of these wastes were managed "on-site." (Unused rocket propellants and explosives, however, would always have been returned to central supply depots and not disposed of on-site.) It is further conceivable that wastes generated at one of the Nike properties may have been transferred to its companion property for management or disposal.

Wastes related to missile operation and maintenance would not have been purposely transferred from a battery operating area to a housing area with no facilities for waste management or disposal. In some instances, however, the sewage treatment facilities for all Nike battery properties were located at the housing area; that possibility cannot be automatically ignored. Finally, where housing areas received various utilities from either of the operating areas, it is also possible that wastes disposed of on those other properties may have migrated to the housing area via the buried utility lines. And since decommissioning of the Nike batteries did not normally involve removal of buried utility or communication lines, any such contaminant migration is likely to have gone unnoticed.

2.3.2 Milford Housing Units

The Milford housing area was developed in 1958 as a stand-alone housing facility for military personnel assigned to the Milford Nike battery. Sixteen single-family houses of "Capehart"-style were erected on the property. (Capehart is the model name assigned to these houses by the builder, National Homes.) Construction of the houses included the installation of 275-gallon underground fuel-oil storage tanks behind each house as well as the later (1966) installation of a fence around the property.[2] Hot water facilities consisting of 80-gallon electric water heaters were also provided for each house.[3] In 1979, each house had a smoke/heat detector installed.[3] Approximately two years ago, all underground fuel-oil storage tanks were replaced with new above-ground tanks.[8] In 1988, all the houses were renovated. New vinyl siding, roofs, gutters, downspouts, chimneys, heating units, kitchens, and bathrooms were installed.[8]

Since the initial property development in 1958, no other construction or improvements have taken place other than the recent renovations.

2.4 ENVIRONMENTAL SETTING AND SURROUNDING LAND USE

Milford is on Long Island Sound, near the mouth of the Housatonic River. Its economy is mainly based on oyster/clam commerce, and secondly on agriculture, light industry, and summer tourism. Generally, the area is flat to hilly and drained through groundwater and tributary streams into Long Island Sound.

The housing facility is situated on sloped land. It is bounded on the north by the former government Nike fire control area, now owned by the Quinnipiac Council Boy Scouts of America, Inc., and bounded on the south by Eels Hill Road and by residential property.[5] Eels Hill Road was a government built road at the time of construction of the Nike fire control area. The land drops off sharply from north to south in an elevation decline from 320 feet on the north to 118 feet on the south.[8] The north and northeast boundaries are fenced, and beyond them the land is wooded with much underbrush coverage. Milford has a 1986 estimated population of 49,000.[9]

2.5 GEOLOGIC AND HYDROLOGIC SETTINGS

Milford is located in the lower Quinnipiac River Basin of the New England Upland section of the New England Physiographic Province. The Quinnipiac River Basin area in south-central Connecticut covers 362 square miles and includes all drainage basins that enter Long Island Sound from the Branford to the Wepawaug Rivers. Precipitation averages 47 inches per year and provides an abundant supply of water. Of the total annual precipitation, 21 inches return to the atmosphere as evapotranspiration; the remainder flows directly to streams or percolates to the water table and discharges to Long Island Sound. Small amounts of water are exported from the basin by the New Britain Water Department; small amounts of water are imported to the basin by the New Haven Water Company.

The average annual runoff of 164 billion gallons represents the amount of water potentially available in the area over the long term, but only part of it is presently utilized. Data for 1970 show that only 22% was actually used during that year. Some industries along the Quinnipiac River reuse water; if industrial development continues, reuse will increase.

Stratified drift is the only aquifer capable of large sustained yields of water to individual wells. Yields of 64 screened wells tapping stratified drift range from 17 to 2,000 gallons per minute (gal/min); their median yield is 500 gal/min.[10]

Till is widespread and generally provides only small amounts of water. Wells in till normally yield only a few hundred gallons of water daily and commonly are inadequate during dry periods. Till is generally used only as an emergency or secondary source of water.

Bedrock aquifers underlie the entire area and include sedimentary, igneous, and metamorphic rock types. These aquifers supply small but reliable quantities of water to wells throughout the basin and are the chief source for many nonurban homes and farms. About 90% of the wells tapping bedrock yield at least 2 gal/min, and much larger yields are occasionally reported. Maximum well yields of 305 gal/min for sedimentary, 75 gal/min for igneous, and 200 gal/min for metamorphic bedrock have been reported.

The natural quality of water in the area is good. The water is generally low in dissolved solids and is soft to moderately hard. Surface water is less mineralized than groundwater, especially during high flow when it is primarily surface runoff. Iron and manganese occur in objectionable concentrations in parts of the basin, particularly in water from streams draining swamps and in water from aquifers rich in iron- and manganese-bearing minerals.

Human activities have modified the quality of water in much of the basin. Wide and erratic fluctuations in concentration of dissolved solids in streams, the high bacterial content of the Quinnipiac River, and locally high nitrate and chloride concentrations in groundwater are evidence of man's influence. Streams, wetlands, and some aquifers along the southern boundary of the basin contain salty water. Overpumping has caused extensive saltwater intrusion in aquifers in the southern and eastern parts of New Haven.

The total amount of fresh water used in the area during 1970 is estimated at 35,710 million gallons, or 183 gallons per day per capita. Public water-supply systems met the domestic requirements of about 90% of the population; all the systems supplied water that met the drinking water standards of the Connecticut Department of Health.[10]

3 ENVIRONMENTALLY SIGNIFICANT OPERATIONS

3.1 FUEL-OIL STORAGE TANKS

Currently, all the decommissioned underground fuel-oil storage tanks remain in place.[11] Each housing unit is supplied with fuel oil for the heaters from the above-ground storage tanks that were installed recently. No soil tests were performed around the underground tanks. Oil-leakage problems with the underground tanks had occurred at units #10 and 16 when these tanks were still in service.[11] In January 1987, a temporary 55-gallon oil tank was installed at unit #10.[12] It was suspected that the old tank at unit #10 might have been filled with water rather than gravel when it was decommissioned. This suspicion was based on a report that oil had seeped upward from the area of the old tank quite recently, causing an odor and affecting the growth of the grass.[13] A section of the backyard of unit #10 showed the presumed effects of an oil leak from the old tank; no indication of such an effect was observed at unit #16. There was evidence of oil around some of the new above-ground tanks from accidental spillage during the filling procedure. Concrete spill-containment boxes are beneath the new tanks.

A canopy affixed to the house above the above-ground fuel-storage tank located in the rear of each unit provides marginal protection from the elements. The tanks appear to have been coated with primer only and not to have been coated with an adequate protective finish. Frequently observed areas of rust on the new tanks reinforce this perception. Moreover, a rupture and leakage of oil from a similar above-ground storage tank at another Connecticut military housing facility has been reported. Therefore, continued use of these tanks in their present condition may entail a significant environmental risk.

Potential risk to health might also attach to the collection of rainwater in the storage-tank containment box if the water is allowed to stagnate. On the other hand, if the occupant of a housing unit opens the containment box drainage top to release rainwater but forgets to close it, the effectiveness of the box in containing an oil leak would be compromised should a tank rupture occur.

3.2 ASBESTOS-CONTAINING MATERIALS

Vinyl asbestos floor tiles were used in the original construction of the housing units. The Area Facilities Engineer reported that insulation generally is present on water pipes in the utility rooms of the units and also contains asbestos. Inspection of the interior of one of the housing units during the site visit revealed that there was no insulation on the water pipes in this particular unit. The floor tiles were observed to be in good condition.

4 KNOWN AND SUSPECTED RELEASES

No hazardous materials or hazardous wastes are stored on site, and no evidence of contamination from housing activities has been documented.

There is suspected soil contamination from a failed underground fuel-storage tank. However, no sample data were found during the site visit to indicate that there was contaminated soil in the failed-tank area at unit #10. Documentation as to whether the failed tank was properly decommissioned was unavailable. Subsurface petroleum contamination may have resulted from reported problems with this tank. No confirmatory sampling was conducted and no remedial action was taken. A similar condition of subsurface contamination may also exist at the abandoned underground tank behind unit #16.

5 PRELIMINARY ASSESSMENT CONCLUSIONS

Although this housing area was originally developed in support of a Nike missile battery located in Milford, Conn., all available documentation and circumstantial evidence suggest the fully independent operation of the housing property from other Nike activities. No Nike-related wastes were delivered to this property for management or disposal. Furthermore, since this property was independent of the Nike missile operations with respect to all necessary utilities, there is no possibility of migration of Nike-related wastes along buried utility lines.

Despite its independence from Nike battery operations, this property could adversely affect the environment if the above-ground fuel-storage tanks that service the housing units were to remain in their present potentially unsafe condition. It should also be recognized that the concrete containment box beneath each storage tank would be rendered ineffective if the drainage top of the box were to remain open for an extended period of time.

There may have been leakage of oil from the old underground fuel-storage tanks while they were in service. At least one of these underground tanks (unit #10) may not have been properly decommissioned.

Floor tiles known to contain asbestos are in good condition.

6 RECOMMENDATIONS

The Milford housing facility presents no imminent or substantial threat to human health or the environment. There is no evidence to suggest that hazardous or toxic compounds have ever been released from this property. No immediate remedial actions are warranted for this facility. Nevertheless, environmental impacts from this property are suspected, and some actions are warranted.

The integrity of the new above-ground fuel-storage tanks should be confirmed, and following treatment for existing rust, protective coatings should be applied to the exteriors of the tanks. With respect to containment-box drainage tops, some method should be devised to ensure that they do not remain in the open position for extended periods of time.

Information indicates that units #10 and 16 had an oil leak from their respective underground tanks. Sampling and analysis of soils in the portions where the old fuel-oil storage tanks are buried should be conducted to identify any contamination.

These recommendations assume that this property will most likely continue to be used for residential housing.

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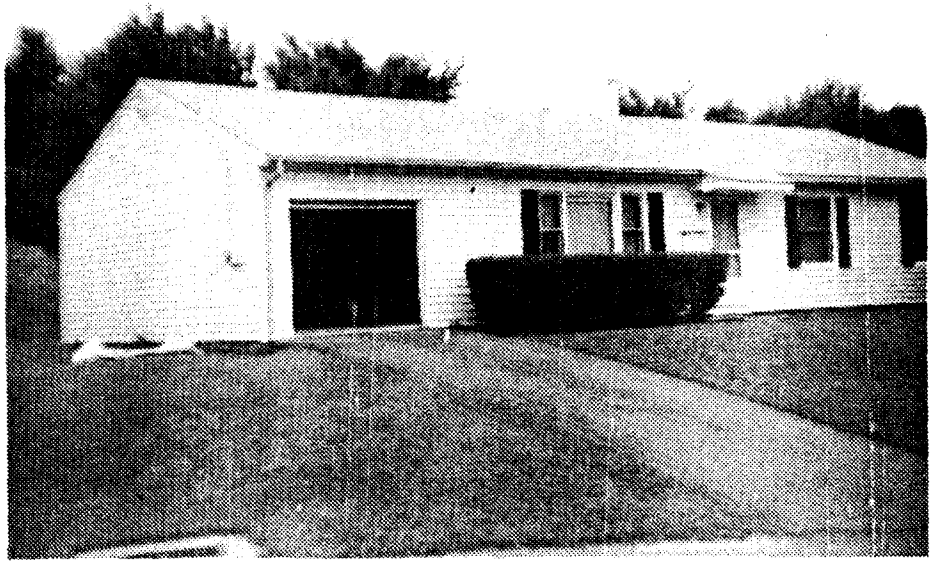
APPENDIX:

PHOTOGRAPHS OF MILFORD HOUSING FACILITY AND SURROUNDING LAND

1

2



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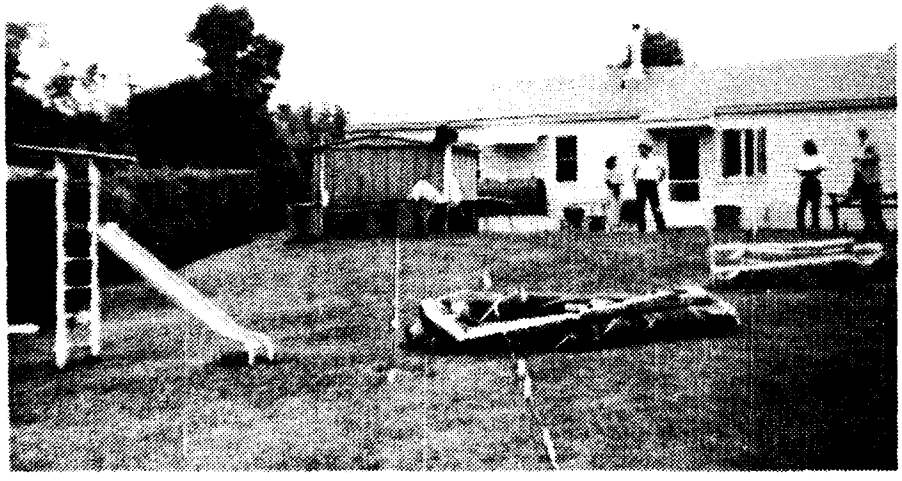

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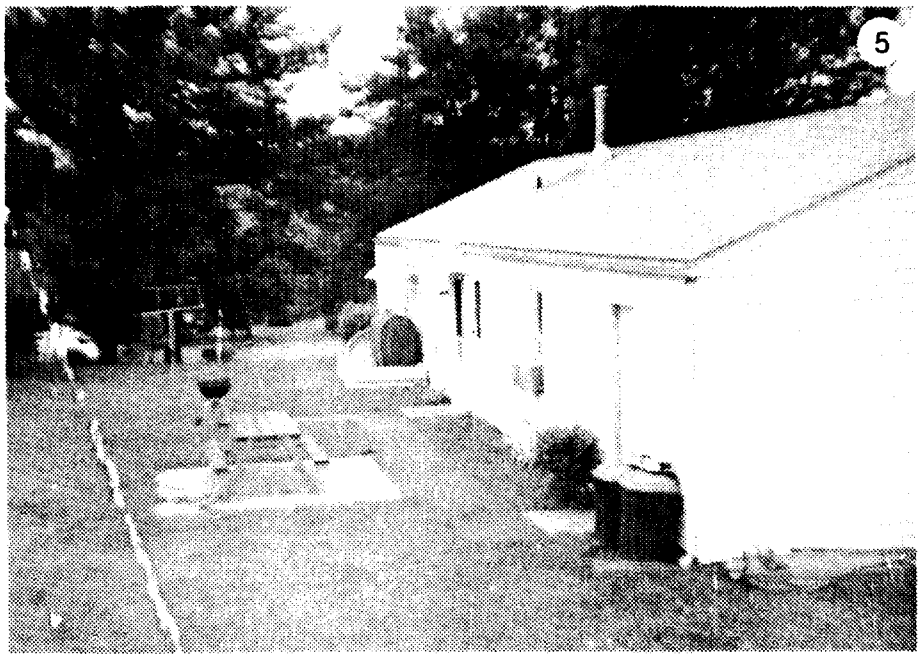

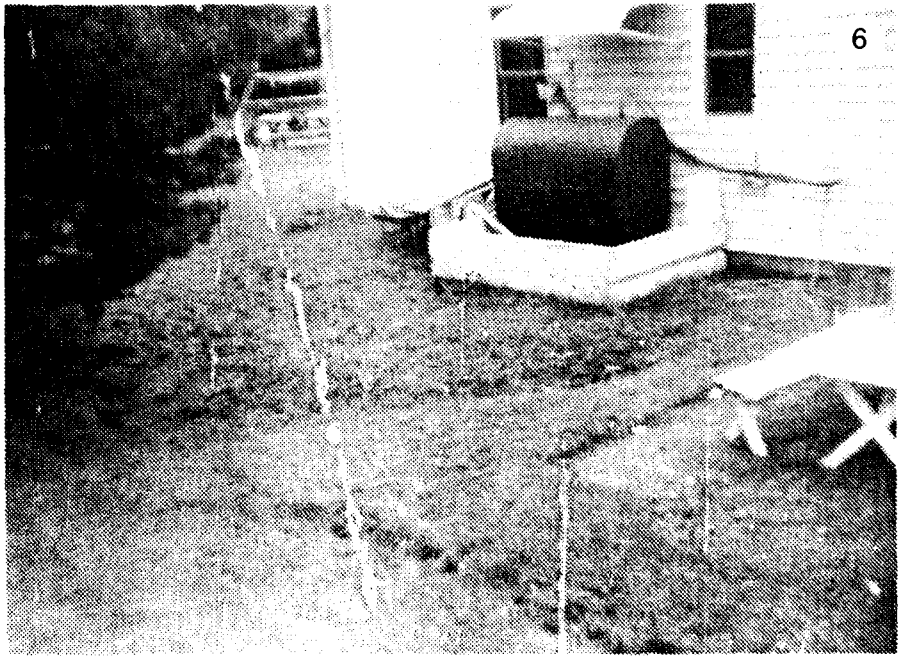

IDENTIFICATIONS OF PHOTOGRAPHS

1. A Capehart-style home with no garage.

2. Another Capehart-style home with attached garage.

3. The rear and backyard of a housing unit; above-ground oil storage tank to the right of the shed; canopy above the tank and extending from near the top of the house helps provide limited protection for the tank; in the background is a radar tower, still situated on the former fire-control site of the decommissioned Nike battery.

4. Electrical transformer mounted near the top of the utility pole; transformers are the property of the federal government.

5. A view at the rear of another housing unit; concrete trough underneath the above-ground storage tank contains miscellaneous items and is used for storage at this unit; the trough is meant to contain oil leaks and therefore must be free of other items to work efficiently.

6. Above-ground storage tank behind housing unit #10; the saturated condition of the soil in the vicinity of the tank indicates an oil leak; this leak appears to be from the underground tank, which remains buried below the above-ground tank.